

51
C3
--72. (New) The integrated circuit of claim 51, wherein the ruthenium-containing layer includes a nitrogen-passivated portion at the textured surface.

73. (New) The integrated circuit of claim 51, wherein the ruthenium-containing layer includes a nitrogen-passivated and oxygen-passivated portion at the textured surface.--

REMARKS

Reconsideration of the subject application is requested in view of the preceding amendments and the following remarks. Claims 51-53 are amended, claims 54-55 are cancelled without prejudice, and new claims 72-73 are submitted for consideration. Upon entry of this Amendment, claims 51-53 and 72-73 are in the application.

The specification is amended to correct an obvious typographical error.

Support for new claims 72-73 can be found in the application at, for example, page 6, lines 28-33, page 7, lines 3-9, and cancelled claims 54-55. No new matter is introduced.

According to the Office action, this application is not subject to examination under the changes to 35 U.S.C. § 102(e) of the American Inventor's Protection Act of 1999 as this application was not filed after November 29, 2000. The filing date of the subject application is October 29, 2001 and clarification is requested.

Claims 51-55 stand rejected as allegedly anticipated by Uzoh et al., U.S. Patent 6,409,904 (Uzoh). This rejection is traversed. The rejection of claims 54-55 is moot in view of the cancellation of these claims without prejudice. Claim 51 recites an integrated circuit comprising a supporting structure and an enhanced-surface-area electrically conductive ruthenium-containing layer situated on the supporting structure. The ruthenium-containing layer has a non-textured surface adjacent the supporting structure and a textured surface with a mean feature size of at least about 100 Angstroms opposite the non-textured surface. Uzoh does not teach or suggest such an integrated circuit. According to Uzoh, a conductive layer, such as a copper layer, is plated over a seed layer of copper or gold. Col. 5, lines 16-19 and col. 6, lines 18-20. The conductive layer includes grains associated with the grain size and crystal orientation of the seed layer. Col. 2, lines 23-25 and col. 6, lines 23-28. Uzoh is silent concerning an electrically conductive ruthenium layer having both textured and non-textured surfaces as recited in claim 51. While Uzoh suggests that ruthenium can serve as a conductive

material, conductive layers according to Uzoh retain the grain structure of the seed layer. In contrast, the ruthenium-containing layer recited in claim 51 includes a textured and a non-textured surface, and hence does not retain a grain structure of a seed layer. Therefore, claim 51 and dependent claims 72-73 are properly allowable over Uzoh.


Claims 52 and 53 recite integrated circuits that comprise a supporting structure and an enhanced-surface-area electrically conductive nitrogen-passivated or nitrogen-passivated and oxygen-passivated ruthenium-containing layer, respectively. The passivated layers are situated on the supporting structure, and have a non-textured surface adjacent the supporting structure and a textured surface with a mean feature size of at least about 100 Angstroms opposite the non-textured surface. Uzoh does not teach or suggest such integrated circuits. As noted above, Uzoh teaches conductive layers that retain the grain and crystal structure of a seed layer, and thus Uzoh does not teach a conductive layer having a textured surface and a non-textured surface as recited in claims 52-53. Therefore, claims 52-53 are properly allowable over Uzoh.

In view of the preceding amendments and remarks, claims 51-53 and 72-73 are in condition for allowance and action to such end is requested.

Respectfully submitted,

KLARQUIST SPARKMAN, LLP

By



Michael D. Jones
Registration No. 41,879

One World Trade Center, Suite 1600
121 S.W. Salmon Street
Portland, Oregon 97204
Telephone: (503) 226-7391
Facsimile: (503) 228-9446

**Marked-up Version of Amended Claims and Specifications
Pursuant to 37 C.F.R. §§ 1.121(b)-(c)**

Please replace the paragraph beginning on page 6, line 1, with the following paragraph:

--If the layer 12 is formed via CVD, the deposition may be performed, for example, at pressures of 1-20 torr, desirably about 5 torr. The oxygen may be supplied in the form of O₂ or other oxidizing gas, such as N₂O, NO, or ozone (O₃). The oxygenating gas and a ruthenium precursor, and suitable diluent gasses, if desired, may be supplied at suitable flow rates, such as in the range of about 100-2000 sccm. Alternatively, the ruthenium precursor can be **[deliver]** delivered by direct vaporization. Deposition may be performed for a time in the range of about 10 to 500 seconds, desirably for sufficient time and under sufficient conditions to deposit RuO_x or RuO₂ to a thickness in the range of about 100 to 600 Angstroms.--

Please amend the claims as follows:

51. (Amended) An integrated circuit comprising:

a supporting structure; and

an enhanced-surface-area electrically conductive ruthenium-containing layer situated on the supporting structure, the ruthenium-containing layer having a non-textured surface adjacent the supporting structure and [having] a textured surface with a mean feature size of at least about 100 Angstroms opposite the non-textured surface.

52. (Amended) An integrated circuit comprising:

a supporting structure; and

an enhanced-surface-area electrically conductive nitrogen-passivated ruthenium-containing layer situated on the supporting structure, the ruthenium-containing layer having a non-textured surface adjacent the supporting structure and [having] a textured surface with a mean feature size of at least about 100 Angstroms opposite the non-textured surface.

53. (Amended) An integrated circuit comprising:

a supporting structure; and

an enhanced-surface-area electrically conductive nitrogen-passivated and oxygen-passivated ruthenium-containing layer situated on the supporting structure, the ruthenium-containing layer having a non-textured surface adjacent the supporting structure and [having] a textured surface with a mean feature size of at least about 100 Angstroms opposite the non-textured surface.